NASA-KSC/EX-E High Education
Internship Project & Abstract Form

Please provide this information requested to: rose.m.austin@nasa.gov
Telephone: 321.867.6481

Full name (First MI Last):	Ray O Parker
Academic Institution:	Rensselaer Polytechnic Institute
City, State Zip Code:	Troy, NY 12180-3599
Program Hired Under (Funding Source):	ACCESS
Name of Branch or Division:	Applied Physics Branch
Desk Location (Bldg Name, Cube #):	O&C, Cube #: 1730C
Work Phone (If Applicable):	7-6970
Cellular Phone:	
Degree of Study: (i.e. MBA, BS in Electrical Engineering, etc) Major & Minors	Bachelor of Science Major: Chemical Engineering Minors: Biophysics, Biochemistry, Philosophy
Expected Graduation (Month/ Year):	05/2016
Project Title:	RESOLVE Project

Project / Abstract Summary: (Approximately 300 words)

One complete paragraph in itself (not an introduction). It should indicate subjects while also stating objectives of the project. Newly observed facts and conclusions of project discussed must be stated in summary form. Readers should be able to understand your project and what you completed in your abstract.

The RESOLVE project is a lunar prospecting mission whose primary goal is to characterize water and other volatiles in lunar regolith. The Lunar Advanced Volatiles Analysis (LAVA) subsystem is comprised of a fluid subsystem that transports flow to the gas chromatograph – mass spectrometer (GC-MS) instruments that characterize volatiles and the Water Droplet Demonstration (WDD) that will capture and display water condensation in the gas stream. The LAVA Engineering Test Unit (ETU) is undergoing risk reduction testing this summer and fall within a vacuum chamber to understand and characterize component and integrated system performance. Ray will be assisting with component testing of line heaters, printed circuit heaters, pressure transducers, temperature sensors, regulators, and valves in atmospheric and vacuum environments. He will be developing procedures to guide these tests and test reports to analyze and draw conclusions from the data. In addition, he will gain experience with preparing a vacuum chamber with fluid and electrical connections. Further testing will include integrated testing of the fluid subsystem with the gas supply system, near-infrared spectrometer, WDD, Sample Delivery System, and GC-MS in the vacuum chamber. This testing will provide hands-on exposure to a flight forward spaceflight subsystem, the processes associated with testing equipment in a vacuum chamber, and experience working in a laboratory setting. Examples of specific analysis Ray will conduct include: pneumatic analysis to calculate the WDD's efficiency at extracting water vapor from the gas stream to form condensation; thermal analysis of the conduction and radiation along a line connecting two thermal masses; and proportional-integral-derivative (PID) heater control analysis. In this Research and Technology environment, Ray will be asked to problem solve real-time as issues arise. Since LAVA is a scientific subsystem, Ray will be utilizing his chemical engineering background to operate the near-infrared spectrometer and GC-MS instruments during ETU testing. Ray will be working with Modified Commercial off the Shelf (MCOTS) instruments and characterizing their analytical behavior for optimization. Ray will be offered the opportunity to suggest testing modifications or configuration changes at any time to improve the experimental effectiveness. He will gain many skills needed for working in a technical team setting requiring flexibility and critical thinking.

If you are writing a paper for school or specific internship program, provide the following:

Paper Title:	**RESOLVE** Project
Mentor Name:	**Janine E. Captain**
Mailcode:	NEL50